

# Impact of International Perspectives on American Agriculture in the 80's

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I congratulate all of you who have chosen agricultural education as a career. You are in a profession that is here to stay. Every year some 90 million people are added to the world's population; and despite continuing or intermittent economic problems, most of the resulting need for food and fiber is converted to demand. On a global scale, food production needs to, and has been increasing; but still too large a proportion of the world's population are chronically hungry. To change this we must constantly search for systems of production and distribution which will involve and benefit more people, which will make food available and affordable to all. Fortunately, there are no natural, but only man-made barriers to achievement of this goal. The challenge for you as agricultural educators is to motivate and train those who can remove these barriers.

My observations this afternoon fall under four headings (1) an introduction to FAO; (2) the global food and agricultural situation facing agricultural educators in the '80s; (3) implications of the current and evolving global economic, social, and political situation for agricultural education; and (4) the contribution of the U.S. agricultural education and training established to overcoming the problems of hunger and poverty.

## Introduction to FAO

Since much of the information I will draw upon in my remarks today, and the biases I will inevitably display, derive from long years of association with FAO around the world, let me begin by telling you a little bit about this Organization, which is too little known here in the U.S.

FAO was founded in 1945. It is the specialized agency within the United Nations system established to deal with the problems of increasing food and agricultural production, raising levels of nutrition, and improving the living conditions of rural people. Everything having to do with development, utilization, and conservation of natural resources for crops, livestock, fisheries, and forestry, falls within that mandate. We are, to begin with, the world's largest single source of information in these areas and have always attached great importance to assembling, analyzing, and disseminating information for use by governments, universities, and food producers themselves. As the main international forum for food and agricultural questions, we are facilitators of international policy

Kimmel, the North American Representative for the Food and Agricultural Organization of the United Nations, gave this paper before the annual NACTA Conference, Delaware Valley College, Doylestown, PA, June 14, 1982.

formulation and inter-country cooperation. And, above all, we are providers of technical assistance and mobilizers of financial resources for programme action at the national and regional levels. Our technical assistance covers everything from resource surveys through pilot projects in production and processing, institution building and improvement, training and administration to agrarian reform and nutritional improvement programmes. We have 152 member nations and at last count had 2,900 professional staff engaged in 2,300 projects in 128 countries.

Of special relevance to this meeting, FAO assistance to agricultural education, training, and extension has been a prominent part of our worldwide programme from the outset. This year, we have 160 projects with substantial agricultural education and training components operating in 66 countries. They are helping governments to analyze manpower requirements, develop better systems of education and training, and improve curricula, methods, and management of agriculture, fishing, and forestry education at all levels. We conduct or support specialized training at national and regional levels and provide opportunities for training abroad. For example, about 300 persons a year are engaged in formal education, specialized training, or study tours in the U.S. alone.

Despite the size of this worldwide programme, I don't want to exaggerate FAO's contribution or its success in solving world food problems. As I will note in a moment, hunger persists and may in fact be spreading. Also, FAO is not alone in addressing aspects of a problem which is so complex and pervasive that it involves the efforts of nearly every governmental department and every international agency, not to mention the huge parallel systems in the private sector. FAO works closely with its member governments and with most other agencies of the UN system, as well as with bilateral, philanthropic, and private voluntary agencies. Within the UN, our most extensive working relationships are with UNDP, the World Bank, the International Fund for Agricultural Development and the UN Environment programme. FAO and the UN jointly manage the World Food Programme.

But the important thing to bear in mind is that all of this together is still only a supporting contribution. It is the food-deficit countries themselves that must make the tough policy decisions, provide the bulk of the human and financial resources, and prepare and implement the needed programmes. Basically, these countries must feed themselves, build their own institutions and social systems, and care for their own

people. And to an extent not always recognized, they are doing so. Remember that 90 percent of all the food eaten in the world never crosses a national frontier.

### The 80's Global Food Situation

Now let's take a brief look at the state of food and agriculture today and the outlook for the future. A useful starting point is recognition that despite urban migration, more than 60 percent of the people in developing world nations still live in rural areas and are dependent on agriculture for their livelihood. In most of these nations, particularly the poorest, the land-water resource base offers the main or even only resource for economic growth and social progress, for financing development and government services, and for earning foreign exchange from exports.

In light of this agricultural dependence, there are two factors that stand out in the world today and which FAO has struggled with over the years. The first is an urban-industrial bias that has generally marked policies and investment in the newly independent developing countries over the past several decades. The second is the array of international trade, investment and development assistance policies of the rich industrialized countries which have failed to give the needed priority to food and agricultural development in the developing world. In both of these areas, may I say, there is a discernible change for the better in understanding of development problems, but still far too little translation of that awareness into policies, programmes, and the institutional changes that must go with them. The current world economic recession adds both to the problems and the inertia on the part of governments.

As a result, the rate of development is slowing and so is the struggle to eliminate hunger. The World Bank estimates that up to 800 million people — just less than one in five of the world's population — exist in absolute poverty, most in the developing world and most of those in the rural areas. The 39 poorest countries in the world, with a combined population of 2.6 billion, have an average per capita income of just \$250, compared to more than \$10,000 in the industrialized bloc. FAO estimates that 435 million people were chronically undernourished in the 1974-77 period. With population growth and a global economic slump, it is hard to believe that the number of hungry is not far higher today.

For those of us who live here in the U.S., these hunger statistics seem hard to believe. Our granaries are bursting, exports flat, prices are down, and farmers are going broke. The worldwide harvest of cereal grains last year exceeded 1.5 billion tons for the first time in history. World carryover stocks are 18 percent of annual consumption, which FAO considers a safe margin. But we also know that this global overview is misleading.

A few nations, headed by the U.S. and Canada, produce huge surpluses and ship better than 200 million tons of grain to foreign markets. But the world's hungry are elsewhere — two-thirds of them in the teeming countries of South Asia and another 15 percent in Africa. In the 1970s, food production lagged behind population growth in 52 countries, with the most serious shortfall occurring in Africa. Not surprisingly, the poorest production records are found in 30 to 40 of the world's poorest nations, which cannot afford to import enough to make up the shortfall in their own harvests. And in each of the past five years food aid as a percent of import needs of the developing countries has fallen. It was over 30 percent a decade ago, and down to 10 percent last year.

Even in this time of good harvests, 23 nations are experiencing abnormal food shortages and 22 countries report unfavorable growing conditions. The extreme, largely weather-produced fluctuations in harvests from year to year and nation to nation are another dimension of the hunger problem, a problem compounded by the lack of an international reserve system for sharing stocks in times of natural disasters. Then, too, there is the problem where national supplies are adequate but millions of people are denied food because they are too poor to buy it. We estimate that there are 167 million households of smallholders or landless in the developing world who cannot provide an adequate food supply even in good years. And these people often live in countries where a small minority of large landowners control 80 percent of all fertile lands.

Recently, FAO completed a massive and very careful study called "Agriculture: Toward 2000." Unfortunately, it forecasts that hunger will grow much worse before the end of the century if present trends in production, population, economic growth and per capita incomes continue. Some 34 countries, holding more than half the developing world population outside China, would still fall far short of meeting national average food requirements. The number of undernourished would rise above 500 million by 1990 and close to 600 million by 2000. If these countries are unable to continue their recent rate of growth in imports, hunger would stretch out to still another 100 million people — a staggering total in all.

However, this prescription for disaster need not happen. The 2000 study offers a different scenario, completely feasible, if the food-deficit developing countries can increase their agricultural investment, and if they are helped to do so by better cooperation on the part of the rich world. Rather than rise, hunger levels could be cut by more than half. The question is whether the necessary measures will be taken — in both rich and poor countries. We don't know the answer to that question, but we do know that the outlook today is not conducive to any optimism.

All of you are familiar with what needs to be done to increase agricultural production: higher priorities for agriculture and rural development in national policy and a commensurate level of investment; expansion of irrigated area, increased fertilizer use, improved seed and cultural practices to raise yields; strengthening of research, extension, education and training; and improved administration of farm services, with special emphasis on the needs of small farmers.

I have been speaking mostly today about cereal grain production simply because grains are the basic food for most of humanity; but I would also like to add a word about other important elements of the total food and agriculture picture — livestock, fisheries, and forestry.

Livestock are crucially important in many areas of the world because they can use land resources not suitable for crops. Millions of people support themselves and produce surpluses for sale from cattle, swine, sheep, goats, and even camels, not to mention poultry. FAO is now embarked on a massive programme to eliminate animal trypanosomiasis and thereby to open more than 10 million square kilometers of land to development in an area covering parts of 37 African countries. Think of the rewards if we can succeed.

In fisheries, we are now on the threshold of a new era of development stemming from the establishment by coastal countries of new "exclusive economic zones" which stretch 200 miles from shore. FAO is undertaking a major programme to help these countries train personnel, establish fisheries administrations and develop catching, processing, and storage facilities.

In forestry, world concern is mounting over the rapid destruction of tropical forests, not just to preserve wood resources for construction other industries but to guarantee future supplies of fuelwood for cooking and heating and to block the environmental consequences of deforestation in the form of droughts, floods, and desertification. FAO, through a concept of forestry for local community development, is encouraging development of agro-forestry systems which embody a harmonious use of forest land for lumber and fuel, grazing, integration with crop land and the harvesting of minor products such as honey, berries, and small game.

#### **Implications of the evolving global economic, social, and political environment for agricultural education**

Out of this description of the current and evolving situation of world food and agriculture — and the larger economic, social, and political fabric of which they are a part — it is possible to see directions and developments which will impact on agricultural education. Let me now touch on some of the more general ones as well as those more specific to agriculture.

The first point I would make is that the United States cannot hope to escape from the growing in-

terdependence of nations throughout the world. To begin with, exports and imports are a growing factor in our national economy, more so perhaps than at any time in the past century. Nations depend on us not only for grains but for manufactures, technology and investment capital. Certainly this audience knows what our agricultural exports mean both to farmers and to our balance of trade. Similarly, we are increasingly dependent on imports for a growing number of essential minerals, not least petroleum, as well as for agricultural products like coffee, cocoa, sugar, tea, bananas, and others.

The absolute imperative for this mutually advantageous exchange between nations is political stability, and here I think the export and import of agricultural products play a crucial role. Political stability down through the ages has depended first and foremost on adequate food supplies. Economic failure and food shortages in the volatile world of the developing countries today is a sure prescription for political chaos, internal strife, and international hostility. In contrast, beneficial trade and healthy world economies are the prescription for peace and friendship. As examples of what can go wrong, I ask you to remember Cuba, Ethiopia, and Iran, all once close U.S. friends.

As the wealthiest and most agriculturally prominent nation in the world, the U.S. can, and in its own selfish interest should, play a prominent role in avoiding political instability through enlightened trade and investment policies, modest but relevant technical assistance, and substantially increased financial assistance made available mainly to poorest nations to promote economic growth with equity. With such policies, the already large and rapidly growing developing world market can become almost unlimited as enormous need is converted to demand. And our access to strategic materials and markets will be unfettered.

The second feature of the general world scene is the increasing political power of developing nations as they work together in groups in pursuit of common aims. This new found political power is being wielded today, not in an attempt to gain massive transfer of resources from rich to poor nations but rather to gain a role in the international decision making that affects all nations, to gain some degree of equity in access to opportunities to earn income through trade, transport, finance, insurance, and the exploitation of the world's resources. Today, in relation to population, the developing nations benefit little from the development process. The situation is graphically illustrated by quotation from an address delivered by FAO Director-General Edouard Saouma several years ago:

"The 32 percent of the world's population residing in the rich countries consume 75 percent of the world's resources, command

80 percent of gross national product and control 80 percent of trade and investment, 93 percent of industry, and almost 100 percent of its research."

It is this kind of inequality which has given rise to the call for a New International Economic Order.

Within nations, an interrelated and parallel move for greater equity in access to resources and opportunities to earn income is underway. A reflection of this move with a particular focus on the developing world's majority, the rural poor, is the Plan of Action adopted by the 145 nations participating in the FAO-sponsored World Conference on Agrarian Reform and Rural Development, held in 1979. The equity oriented goals of rural people and the national and international measures for their achievement, which are outlined in this document, provide an increasingly pervasive orientation for FAO's programmes.

These interrelated phenomena are a reflection of the great political changes which have taken place in the world since World War II. Interdependence, the emergence of a larger number of newly independent nations, the availability of educational opportunities to increasing numbers of people and the tremendous advances in communications combine to spell an end to the era in which one or a few nations had the political, economic, and military power to dictate the terms of exchange between nations. We have entered the era of multilateral diplomacy where the world's major problems must be resolved through negotiation of tradeoffs in forums where all nations both contribute and benefit.

Perhaps it is time I come down from the heights of international politics and mention a couple of developments that impact more directly on agriculture.

There can be no doubt that one factor greatly influencing agriculture and, for that matter other sectors of the economy in the future, is the increasing concern over a deteriorating resource base and environment. An enormous threat to the well being of future generations is posed by the destruction of forests, the desertification of grazing lands, the loss of farm land to non-agricultural uses, the diminishing quality of the land and water resources due to erosion, pollution and unwise cultural practices, and the disappearance of genetic resources in both the plant and animal kingdoms. Give credit for increased awareness at the global level to the Stockholm Conference on the Environment and the Establishment of the U.N. Environmental Programme just ten years ago. Les Brown's books *The 29th Day*, and *Building a Sustainable Society*, Eric Eckholm's *Losing Ground*, Rachel Carson's *Silent Spring* and, as recently as May 30, Eddie Albert's one-hour television programme on land and soil conservation in the U.S., have all served to alert the American public to the dangerous situation evolving.

The changing energy availability and cost picture, of which all of you are aware, suggests dramatic changes may be required in farming systems and technologies. Here in the U.S. with our large scale, highly mechanized, inorganic fertilizer, and pesticide-intensive agriculture, we are greatly concerned about the diminishing supply and cost of fossil energy based products. But despite the fossil energy crisis, for some time to come the developing countries, now very moderate consumers, will need to use considerably more of the same chemical fertilizers, pesticides, and fuel which make U.S. agriculture so highly productive. Only in this way can they approach the ambitious annual increases in food production our AT 2000 study suggests are needed to avoid even more extensive hunger than prevails at present. If we look to the future, however, a group of the world's top agricultural scientists assembled in Rome a couple of years ago advised us that we are going to need to think more in terms of a biologically oriented agriculture — a greater role in the maintenance of soil fertility to be played by mixed crop and livestock farming, crop rotation, intercropping, and use of organic matter; rotations and plant breeding to become increasingly important in management of disease and insect pests; and plant breeding, also, to contribute to more efficient use of water and fertilizer through producing plants adapted to unfavorable environments. Perhaps we need to be doing more thinking and research along these lines even here in the U.S.

It seems to me that taken together, the changed global political complexion, the increased pressure on the common resource base and environment, along with changing perception of the objectives of development, pose a major question for agricultural educators worldwide. What production systems, technologies, policies, and institutional arrangements will involve and benefit the largest numbers of people and at the same time, ensure availability of natural resources and the quality of the environment for future generations? To develop and perfect such systems and technologies, appropriate in widely diverse national situations, and to train all who need to be involved — from farmers through scientists — is the challenge for all of the world's agricultural educators in the '80s.

You, as U.S. educators need to address some additional questions. Does a massive drive for exports place unacceptable strains on the U.S. land and water resource base? Exports, also, generate upward pressure on domestic food prices. What is the point where this becomes politically unacceptable? If we are to meet our own food needs, and contribute to meeting those of the rest of the world at the end of the century, is there a need to adopt land use policies to reduce both erosion and land loss to non-agricultural uses? Is there a cause for concern — economic, social, environmental — over the increasing concentration of land ownership?

## Overcoming The Problems of Hunger and Poverty

From what I have been saying, but more especially from your other sources of knowledge, you all have ideas on how these developments can or should be reflected in American agricultural education. Presumptuous though it may be, let me suggest a few things for your consideration, mainly but not exclusively directed to your possible contribution to the training of developing world agriculturalists.

I think it is useful to begin with the recognition that, for a variety of reasons, the overwhelming majority of developing world agriculturalists will be trained in their own or neighboring nations. While hard numbers are difficult to come by, the requirements are so large that it would simply be too expensive to do much of it outside these nations. Just one set of statistics gives some idea of the magnitude of the task. FAO's "Agriculture: Toward 2000" study suggests the number of extension workers in the world will need to increase four and a half times, to 1.25 million, between 1980 and 2000.

Apart from the economic reasons, it is a fact that the majority of these will require training at a level and in technologies and farming systems, languages, cultural, and ecological environments which would be difficult to provide in the United States. We must remember that the main focus will be on farmers with limited education and those who serve them in farming small plots of poorer quality soils, topographically least well situated and watered. Small scale, labor intensive, and sparing in the use of purchased inputs characterize the kind of agriculture for which training is required.

There is, also, the nationalistic political barrier to extensive training abroad. Developing nations are increasingly wanting to become self-reliant individually or in groups, to lessen the feeling of inferiority and dependence on the North, to maintain their cultural identities and put their own imprint on education and other facets of their societies. And the developing nations today do have many training institutions, some already capable of doing a respectable job and others which can be improved.

None of this means that there is not a significant role for U.S. agricultural education to play. It means that the role may be somewhat different from in the past. We can help improve the curricula, the teaching materials, methods, and equipment, in existing developing world schools. Our experience in FAO suggests that the demand here will be less for the comprehensive institution building of earlier years and more in the form of help in strengthening specialized subject matter areas or departments in existing institutions. I believe the U.S. can play a particularly significant role in training teachers of agriculture. Our agricultural education curriculum is unique in its emphasis on the practical and the combination of subject

matter and related teaching know-how. And weakness in teaching staff is a major problem almost everywhere.

This leads me to the question of the kind of U.S. expertise needed to help improve institutions and programmes in the developing world. The overwhelming demand from the developing countries to FAO today is for the individual with a national or international reputation in his field to go abroad for a short period, help map out a programme, go home and return to review and revise as needed. Contrary to the situation of the early fifties, most nations today have a large number of their own nationals trained to BS, MS, and even PhD levels — often many more than available financial resources will permit employing, as in India and Egypt for example. What local staff need is backing up by the authority and experience of a well qualified outsider.

And please don't build up false hopes for your new graduates about the prospects for immediate employment overseas. Encourage them to prepare for future international service by acquiring some languages, a good understanding of the part of the world in which they would like to work, by voracious and continuous reading to keep abreast of world developments, and by acquiring impressive experience in their chosen profession at home.

Foreign students, particularly at the advanced degree levels and in specialized and newly developing fields, will continue to come to the U.S. And certainly many more fairly senior staff will come here to observe and learn how we do things in schools, government departments, cooperatives, on farms, and in factories. For those who come for formal education, it may be possible to orient programmes a bit more to meet their needs. Many times the person who gets a degree in some highly specialized area here goes home, not to teach, do research, or provide purely technical advice but to create or redesign and manage a research institute, school, or government department. I know some institutions are trying but perhaps even more could be done to give most senior foreign students more in institutional development, management, administration, and communications skills. Can not more be done in the way of developing the skills of problem identification and the imagination to improvise, to develop solutions that fit in very different environments from that of the U.S. lab, farm, or agri-business? The description of the food and agricultural situation of the developing world I have portrayed suggests that a direct transplant of our own technologies, farming systems, and institutions is rarely either workable or desirable.

To conclude, let me say something about what I think is a most important task for U.S. agricultural educators and educators in general in this country. It is simply to teach all of our students, from grade school to graduate school, more about the outside world, and

how our relations with other nations directly and indirectly have a major impact on our own quality of life. Just as we have courses in art and music appreciation, why not courses in international development appreciation. I would display my prejudices and go even further to suggest a heavy emphasis on food and agriculture in such courses. After all, food is the most basic of human rights, and the failure to ensure that

right has led to the fall of governments and many of the wars throughout history. As educators, you have the possibility to ensure that successive generations of students understand international development issues and move into positions of leadership, prepared to promote national policies and programmes which will redound to the benefit of the United States and all of the world's nations. I wish you success.

## Partners

# The USDA and American Colleges of Agriculture In Setting Agricultural Education Trends In America

Alan Goecker

The May 12, 1982, issue of *The Chronicle of Higher Education* included a brief report of a New York student who recently conquered the popular video game, Pac-Man. Perhaps it is appropriate to share an edited summary of the article with you.

Eric G. Schwibs, a freshman at the State University of New York at Buffalo, is the self-declared king of Pac-Man. Schwibs put a quarter into the Pac-Man game at a Buffalo tavern at 9:45 on Saturday night and continued to play until 6 o'clock Sunday morning. By that time, Schwibs had accumulated a total score of 2,935,590, at which time Pac-Man suffered a nervous breakdown, filling half of its screen with electronic gibberish.

Following this encounter, Schwibs indicated that he was through with Pac-Man, stating that, "Once you beat the machine like that, there's nothing left." Oh, but there is something left: Ms. Pac-Man, a new video game which now has the attention of Schwibs. "Ms. Pac-Man is harder," he said. "The monsters move randomly."

As we attempt to address emerging agricultural education trends in America, perhaps we are in a Ms. Pac-Man environment with a number of randomly moving forces. Yet, it is my view that there are some rather clearly identified challenges and opportunities facing agricultural college teaching programs during the remainder of the 1980's.

Perhaps the paramount issue facing colleges of agriculture in the next 10 years is declining enrollment. Of course, this is an overriding concern of higher education in general and there are currently some rather significant struggles as various higher education institutions attempt to capture more than their traditional share of the decreasing new student pool.

Goecker is with the Science and Education Administration, USDA, and gave this paper before the annual NACTA Conference at Delaware Valley College, Doylestown, PA, June 15, 1982.

Between 1979 and 1992, the number of 18 year olds in the United States will drop from 4.3 million to 3.2 million, a 26 percent decline in the age group that comprises the bulk of entering college freshmen. Enrollments in colleges of agriculture and natural resources have declined by more than 8 percent during the past three years and several institutions are reporting sizeable anticipated reductions for the 1982 Fall term. After a decade of unprecedented high undergraduate enrollment in agriculture and natural resources, some may react with a sigh of relief and a suggestion that once again teaching quality rather than quantity might be emphasized. However, attracting high quality students is a continuing and, in my opinion, increasingly important challenge which must be addressed.

Human aptitudes required for the development of highly productive agricultural graduates are congruent to those utilized in engineering, business, biology, computer technology, and the health sciences. Agriculture employs and is dependent upon high technology. Agriculture, like the other major academic units, must aggressively compete for a dwindling supply of highly motivated and intelligent students to achieve future efficiencies to feed an expanding world population and enhance our nation's security.

Of particular concern is scientific preparation that current students are bringing to campus from the secondary schools. A 1980 study conducted by the National Center for Education Statistics<sup>1</sup> showed that 79 percent of the high school seniors had completed Algebra I, 56 percent took geometry, 49 percent completed Algebra II, 26 percent finished trigonometry and 8 percent completed a course in calculus. Only 54 percent of the nation's 21,000 high schools offer a course in trigonometry and fewer than one-third (31 percent) teach calculus.

Some 39 percent of the U.S. high school students are enrolled in an academic curriculum, 37 percent in

<sup>1</sup>National Center for Education Statistics. *High School and Beyond: A National Longitudinal Study for the 1980's*. Washington, D.C.: National Center for Education Statistics, p. 5.